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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • JUNE 2, 1945

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MEDICINE

Type Early for Rh

Must be done before the first transfusion is given, British scientists warn. Otherwise transfused blood makes test unreliable.

➤ BLOOD typing to see whether a patient has Rh negative blood, making repeated transfusions with Rh positive blood hazardous or even fatal, must be done before the first transfusions in order to give reliable results, British medical scientists warn in the *British Medical Journal,* (April 28), which recently reached the United States.

The tragic case of a woman who received ten transfusions, most of which were from donors with Rh positive blood, before it was discovered that she had Rh negative blood is described by Drs. R. Drummond, G. L. Taylor and J. T. Rice Edwards. In the meantime she had built up extremely potent antibodies to destroy the Rh positive blood given her. The report reached the *Journal* coincidently with the sad news of the untimely death of Dr. Taylor, one of the pioneer researchers on the Rh blood factor.

The woman came to the doctor's attention suffering from a disease of the lymph glands which necessitated transfusions. She had no apparent ill effects from the first two transfusions. It was after the third that she had trouble and her blood was then typed for Rh. Although her blood was Rh negative, the tests at that time indicated that she was Rh positive, the deceptive results being due to the large quantity of transfused Rh positive blood.

When they later found out that the woman's blood was Rh negative, the physicians were puzzled that there were no more serious symptoms as a result of the Rh positive transfusions. Except for the difficulty with the third transfusion, the first six transfusions showed no obvious ill effects. The symptoms during the seventh were not especially severe. Nothing happened during the eighth and ninth transfusions although bad symptoms did develop later. And yet in the ninth transfusion just about a quart of red blood cells were given—donated by four Rh positive donors;

The scientists believe that the patient withstood this experience because of the fact that the blood was transfused by the slow drip method, which lessens the severity of reactions when they occur.

Extremely potent antibodies, destructive of Rh positive blood cells, were built up in the patient's blood. At one time after the tenth transfusion, her blood was destructive of Rh positive cells when it was diluted to one part in 1,024,000. When a dilution of one part in 64 or one part in 128 is still effective, the agglutinins are usually considered to be very potent.

Fourteen more transfusions were given the patient, using blood from 27 Rh negative blood donors. Although improvement followed each transfusion and the hemoglobin was raised from 29% to 70%, the patient's original illness became worse and she finally died. (*See also page* 346)

PSYCHOLOGY

San Francisco Conference Neglects Important Step

➤ THE TRAINING of the coming generation to accept an international way of thinking is one essential step that is in danger of being overlooked at the San Francisco Conference, and no mention was made of it in the Dumbarton Oaks proposals, declared Dr. Gordon W. Allport, chairman of the Department of Psychology at Harvard University, and Dr. Gardner Murphy, chairman of the Department of Psychology at the Collgee of the City of New York. They pointed out that to date nothing has been said of educational goals for all nations to adopt, nor are there any binding commitments to teach the children of the earth an international way of thinking.

Recommendations to the San Francisco Conference made by Dr. Murphy and Dr. Allport, while speaking as guests of Watson Davis, director of Science Service, on the CBS public service feature "Adventures in Science", included the creation of certain symbols of international unity, such as international scientific institutions, art museums, parks, and even international universities, so that the world over, young people will have something concrete to look to, to admire, to become loyal to.

"I'd like to see a binding covenant that would commit all the United Nations to teach scientific facts about racial and international differences. No race is entirely superior to any other. All are just about alike. The differences in language, color, and custom can be taught in a way to arouse the pupil's interest and respect, rather than in the old-fashioned way, to arouse contempt and hatred. Race prejudice is not instinctive. No child is born a bigot. Our national hatreds are learned, and education should be changed in every country to make sure that wholesome attitudes are learned," Dr. Murphy asserted.

Pointing out that if our peace plans are to work, all races will have to participate equally in the plan for collective security, Dr. Allport urged a world-wide public opinion poll.

"We have excellent means today of finding out what the man in the street wants, needs and thinks. Why shouldn't this method be used to keep statesmen informed of the condition of public opinion all over the world?" Dr. Allport asked.

The two speakers pointed out that for a successful peace we must replace age-old power politics with a policy that makes full use of the state of mind of the common people.

LEAF PATTERN—This photograph of a castor bean, by Jon D. Dodds of Benton, Ky. was selected as the best in the Plant Life Class in the Seventh International Salon of Nature Photography conducted by Hobbies, the magazine of the Buffalo Museum of Science.

MEDICINE

Virus May Cause Cancer

Also being studied are the possible relation of diet to cancer and the effect of spleen tissue on cancer. Successful control now held more likely.

➤ HOPE of success in controlling cancer "within a reasonable time" is held by scientists at the Clayton Biochemical Institute of the University of Texas.

Evidence from their studies tending to show cancer is caused by a virus or virus-like substance is the basis for this hope. At the same time, the Institute is not neglecting other avenues of approach to the problem, including the dietary one. A long-range research program is under way, Dr. Roger J. Williams, director, states in the second report of the Institute's cancer studies.

The virus theory is based on work by Dr. Alfred Taylor and associates. They have been able to produce breast cancers in mice with a virus-like material obtained from the yolk-sacs of chick embryos previously inoculated with extracts of mouse cancer tissue. After the cancer tissue had been growing on the yolk-sacs for a time, the yolk, cancer, blood and fluids of the egg were treated in various ways, including filtration through a fine filter, to remove all cancer and other cells. Only a virus is small enough among living organisms to go through such a filter. Consequently when healthy mice developed cancers after injection of this material, the scientists felt certain it was a virus that caused the cancer.

Latest efforts have been to develop methods for obtaining this cancer-producing material such that the results can always be duplicated and then to develop methods for studying the virus. If this research shows that the cause of cancer is a virus, there is hope that methods of controlling it can be discovered.

Still in the early stages are the studies of the possible relation of diet to cancer and of the effect of spleen tissue on cancer. Spleen cells, Dr. R. E. Hungate and Miss Hester Snider find, always show a tendency to slow or check the growth of cancers in eggs. This finding which supports that of other scientists is considered important because it emphasizes a technique with which a killing of cancer cells by other cells can be studied.

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MEDICINE

Pneumonic Plague Remedy

Sulfadiazine treatment is credited in part for the recovery of one patient. Thiouracil helped seven out of 10 with angina pectoris.

➤ NEW SUCCESSES in treating pneumonic plague, heart disease and psittacosis are reported in the *Journal of the American Medical Association* (May 26), which also reports success with penicillin treatment of neurosyphilis.

Thiouracil, a chemical which suppresses the thyroid gland hormone, helped seven out of 10 patients with angina pectoris, Dr. Wilhelm Raab, of the University of Vermont College of Medicine, reports.

Symptoms were completely relieved in four of the patients during treatment. One was only slightly improved, while two were not helped and died. The treatment is effective in the same way that removal of the thyroid gland helps some patients with angina pectoris. It has the advantage of not involving a major surgical operation. The thyroid hormone, Dr. Raab believes, sensitizes the heart muscle to the oxygen-depriving toxic action of epinephrine, one of the adrenal gland hormones. When the thyroid is removed by operation or suppressed by thiouracil, the heart is protected.

Sulfadiazine treatment is credited in part for the recovery of the pneumonic plague patient. He was a physician engaged in plague research with the U. S. Public Health Service, in the course of which he contracted the disease. No one knows how this accident occurred.

He suffered from the pneumonic form of the disease. Recovery from this is so rare "that for all practical purposes the disease is considered fatal," Dr. Edgar J. Munter, U. S. Public Health Service, points out in his report.

The disease was recognized within 26 hours after its start and treatment started at once. The patient had had a large amount of plague vaccine the year before. This, plus the modern treatment facilities and excellent nursing, probably played a part in his recovery. The disease did not spread to anyone else.

Penicillin, previously found effective in protecting laboratory mice against psittacosis, is credited with helping a human patient to recover in the case reported by Drs. Harrison F. Flippin, Michael J. Gaydosh and William V. Fittipoldi, of Philadelphia.

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PUBLIC HEALTH

Cases of "Diaper Rash" Traced to New Antiseptic

➤ FIVE cases of "diaper rash" have been traced to a new antiseptic solution used by a diaper service, Dr. William L. Dobes, of Atlanta, Ga., has reported. (*Journal, American Medical Association,* May 26)

The solution, marketed under a tradename, was used as the final rinse by the diaper service. The company making the rinse claims, Dr. Dobe states, "that its purpose is to make textiles actively antiseptic as a protection to persons and as a prevention of destruction of textiles by bacteria, germs, mold and mildew."

The chemical is "a primary skin irritant in strong concentration and a sensitizer in weak concentrations," a U. S. Public Health Service official informed Dr. Dobes.

A commercial testing company has reported testing samples of cotton fabric treated with the chemical. No irritated areas developed on any person on whose skin these samples were placed for 48 hours, removed for 24 hours and replaced for another 48 hours.

Dr. Dobes made the same kind of test on one of his patients with one of the diapers treated with a much weaker solution of the chemical. The test was positive after 24 hours.

When mothers of babies who had the diaper rash used their own diapers instead of those from the diaper service, the rash cleared up in three to seven days. It came back immediately when the babies started wearing diapers from the diaper service.

The diaper service was very coopera-

tive and because of the potential dangers, omitted the rinse. The babies got over the rash and have not had any more although the same diaper service is being used. The fact that the antiseptic solution is the only ingredient omitted by the laundry confirms the diagnosis that it was the cause of the trouble.

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OPTICS-PHOTOGRAPHY

Better Photos After Dark

New developments in optical science cut lens reflection. Will mean better photographs will be possible under poor light conditions.

▶ LENSES and glass produced by the American optical industry today by mass production methods are equal to or superior to the best hand-made items produced by German craftsmen, who were long considered leaders in the field. Many important developments that have made this record possible stem from research carried out by scientists at the Frankford Arsenal in Philadelphia, where high-school girls produce lenses and prisms for intricate gunsights, periscopes, and bombsights with speed and precision that is the envy of optical artisans.

From the cutting of the lens blank, through the rough grinding, fine grinding and polishing stages, all of the work is done by machines. With the active cooperation of industry, machines that were never meant to see the inside of an optical shop are speeding the production of lenses. Blanchard machines, used to cut, grind and polish metal, are employed to rough out lens blanks. A curve generator, with a mechanical arm that replaces the human arm, rough-grinds the lens blanks to tolerances of less than one millimeter. Over 60 different kinds of abrasives are used in the grinding of precision lenses. These range from coarse abrasives of synthetic aluminum oxide or silicon carbide in particles as large as 290 microns (one micron equals one-thousandth of a millimeter) down to fine abrasives only five microns in size. One of the fine abrasives used is made from domestic garnets. Enough rouge is used yearly on just one of several dozen lens-polishing machines to supply about 11,000 women with their cosmetic requirements for a year.

As a standard procedure, all lenses manufactured at Frankford Arsenal must be coated with a thin film of magnesium fluoride before being installed in instruments. This coating increases the transmission of light through the lens by 25%, through reducing reflection. This means increased visibility at all times, and particularly at dusk. It extends the good hunting time for our armed forces at least one-half hour at dusk. Since the magnesium fluoride coating permits more light to reach the eye, it will have many postwar uses in spectacles, microscopes and camera lenses. Glass coated with the metal is easier to keep clean, and fingermarks do not show up on it.

Lenses to be coated are mounted in a hemisphere-shaped rack which is suspended inside a large glass cylinder above a crucible cup containing finely powdered magnesium fluoride. The air is exhausted from the cylinder, leaving a nearly complete vacuum. Then a tungsten filament above the crucible cup is turned on and heated to a high temperature. The heat causes the magnesium fluoride to evaporate and condense on the lens surface, leaving a thin, almost invisible, film less than a millionth of a millimeter thick. The process takes about one hour to complete.

By depositing several magnesium fluoride films, one on top of the other, it is possible to increase reflection instead of cutting it down. This discovery may lead to new types of mirrors with the reflecting surface facing out, instead of into the glass.

For years, balsam, an oily, fragrant resin, has been used to seal parts of lenses together. However, since lenses sealed with it would not stand up in the extremely low temperatures encountered in high-altitude flying, or in the heat of a Pacific atoll, a new substitute had to be found. Men from the optical laboratory here went in search of a substitute and came up with new thermal setting cements. The one in use at Frankford Arsenal today is known as CR-39, which looks like kerosene when cool, but becomes a jelly when heated. The formula for this synthetic resin cannot be revealed at present. The other usable cement is a resin containing butyl methacrylate.

In using these cements, the lenses are pre-heated, the cement applied, and then the lenses are baked in an electric oven at about 200 degrees Fahrenheit for as long as 2½ hours. Although balsam is easier to use and dries in 15 minutes, the properties of the new thermal-setting cements make them more desirable for general use.

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A good *queen bee* lays from 2000 to 3000 eggs a day.

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RADIO

Radio Space Allocated

Final decision reached by the FCC on places for standard broadcasting, television, airplane radio, and police. FM is still unsettled.

► AFTER SEVERAL months of deliberation the Federal Communications Commission has finally made up its mind how it will allocate space in the radio spectrum to standard broadcasting, television, airplane radio, police and other services. The stumbling-block in making final the FCC proposals published last January were the long-drawn-out objections registered by owners and operators of Frequency Modulation (FM) radio stations. FM radio is staticless broadcasting.

No final decision has yet been reached by the FCC regarding the place in the radio spectrum that will finally be set aside for FM or for the space below 25 megacycles. Three possible sections of the waveband are under consideration, and during the coming summer months, scientists of the FCC will experiment with FM broadcasting in these three parts of the spectrum to determine which of the three is best for FM radio. These experiments will be conducted at the field offices of the FCC, from which FM broadcasts will originate. Cellulose tape recording equipment that can record sound for several hours without stopping will be placed at various spots in the area around each FM station. Continuous recordings will be made day and night. From these recordings, engineers will be able to find out just which section of the spectrum permits FM broadcasting with the least interference.

The spectrum is still congested, although every service that asked for space in the airlanes got at least a part of what it asked for. In making the decisions, the commissioners engaged in a give-and-take study, giving more space to services which proved by their testimony that they needed more frequencies in order to carry out their operations in the public interest, and to new services that promise to extend the use of radio to the benefit of more people.

Probably the most important new radio service is the Citizens Radiocommunication Service, which will make it possible for every U. S. citizen to have his own broadcasting station in the form of walkie-talkie or handie-talkie equipment. Regulations covering licensing and operation of the equipment will be simple and easy to comply with. The only stipulation made by the FCC is that no charge may be made for messages carried over the air in this portion of the spectrum.

Other new services that have heretofore never been licensed are radio for railroads; rural radio communication for farmers that will permit them to reach telephone communication lines and make use of telephone service even though they have no telephones; and mobile radio for buses and cross-country trucks.

The allocations extend to 30,000,000 kilocycles in the spectrum, farther than the FCC has ever before licensed. This is by no means the upper limit of the radio spectrum, and in the future the FCC may allocate channels to services beyond that super high frequency range.

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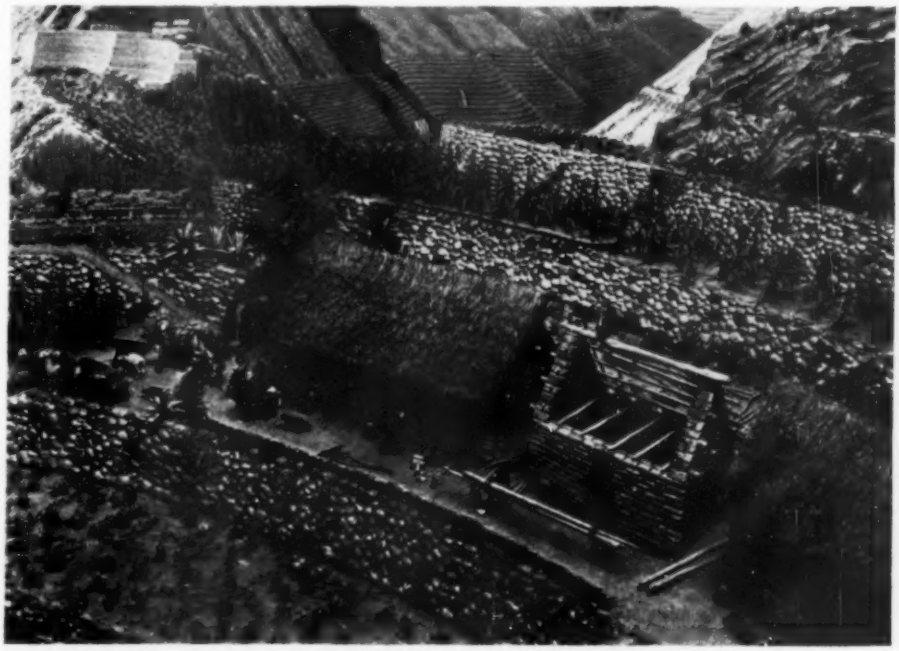
CHEMISTRY

Training of Chemists at Standstill Due to War

► WAR HAS all but stopped basic, academic research in chemistry and has stopped the training of new research chemists and chemical engineers, Dr. Roger Adams, leading organic chemist, head of the University of Illinois chemistry department and head of chemical work of the U. S. Office of Scientific Research and Development, charged in a radio talk.

"Basic scientific research finds new truths, and supplies new material upon which much of the industrial progress of the future depends," Dr. Adams said. "Years will be required before basic research activity again reaches its prewar level.

"The war also has stopped the training of new research chemists, and chemical engineers. Thousands of academic and industrial chemists have been drafted



INCA VILLAGE—A miniature model of an Inca village, as it appeared about A.D. 1450 in the Urubamba Valley in southern Peru, has been completed at the Chicago Natural History Museum, and added to the exhibits. The model is based upon observations of ruins made by Donald Collier, curator of South American ethnology and archaeology, during expeditions to South America. The scene represented is in a mountain valley at an elevation of 9,000 feet, near Cuzco, which was the capital of the Inca empire. The village represented is still inhabited by modern descendants of the ancient Incas.

into the armed services with only a few of them in a position where they can use their technical knowledge.

"The research organizations associated with industry, which find new products and upon which industry relies for expansion and for creation of new jobs, are at a low ebb. There is no possibility that they can recover quickly in the near future. This is a matter of great concern to the scientists and should be to the public, for only by years of patient research by trained and competent investigators can we maintain the high level of achievement in the field of science, on which is based position of eminence among nations."

Dr. Adams talked during the intermission of the New York Philharmonic Symphony broadcast sponsored by the United States Rubber Co.

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METEOROLOGY

Pacific Area Typhoons

Due during the summer and fall months, they are similar in violence, velocity and rainfall to the Atlantic and Gulf Coast hurricanes.

➤ TYPHOONS in the Pacific war area, due during the summer and fall months, will be something new to many American soldiers and sailors, but not to those who know the hurricanes of the Atlantic and Gulf coasts. They are similar in origin, nature, violence, velocity and the amount of rainfall accompanying them. They constitute real hazards for both sea and aircraft. Some 20 severe typhoons occur each year in the Philippine-Okinawa-Japan region.

The usual path of the Pacific typhoon is northerly, along the 1,000-mile eastern coast of the Philippine Islands, sweeping Formosa, and Okinawa and the other Ryukyu islands, and passing northeastward along the coasts of the Japanese mainland. Some pass through the Philippines into the South China sea and the coasts of Indo-China and southern China. Others pass through the Ryukyu islands into the East China sea.

The season for these typhoons extends from early August until late October but many of the most severe of them have occurred in July and in November. They occur in the season when the belt of equatorial calms in the Pacific reaches its most northerly extension. They are usually from 50 to 100 miles in diameter, and move forward rather slowly, but the circular whirl of air in them often reaches a velocity of 100 miles an hour or more.

They are usually accompanied by heavy rains which extend inland, covering western ports on the Philippines and other islands, making land movements as well as ship movements difficult. In one typhoon, Baguio, the summer capital of the Philippines, experienced the heaviest 24-hour rainfall ever recorded, 46 inches, approximately the annual rainfall in eastern United States. This storm was on July 14-15, 1911.

Tropical typhoons and hurricanes originate over oceans, where there is plenty of moisture and little resistance to winds, in the regions where the trade winds are dying out and merging with the doldrums or calms. The heat and the moisture of the doldrums are probably responsible. Typhoons and hurricanes form when the doldrums have moved away from the equator, where the deflective force of the rotation of the earth is sufficient to set up the whirl. In most cases the storms move westward as carried by the trade winds, then curve toward the poles of the earth. When they reach the middle latitudes, or over land, they lose some of their intensity and spread out, becoming less destructive.

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HOME ECONOMICS

Vitamin C to Keep Canned Fruits Bright

➤ A WAY has been found for home canners to keep their fruits from turning dark in the jars and developing an off flavor. It consists in adding vitamin C to the fruit during canning. Research showing that this will work and how the housewife can apply the findings is reported by J. J. Powers and Dr. C. R. Fellers, of Massachusetts State College, in the *Journal of Home Economics*.

The home canner gets her vitamin C in tablets at the drug store. Another related chemical will do the job, too, and is cheaper but because of the war it is not now available commercially. Each vitamin C tablet sold in drug stores is made to contain either 25 milligrams (abbreviated mg), 50 mg or 100 mg of the vitamin. The label tells which.

For each pint jar the home canner should use one and one-fourth tablets of the 100 mg strength, or two and one-half tablets of 50 mg strength, or five tablets of 25 mg strength. If the label gives the strength in International Units, abbreviated IU, instead of milligrams, divide by 20 to convert into milligrams. If the potency of strength is 2000 IU, this is equivalent to 100 mg and you use one and one-fourth tablets for each pint jar. The 25 mg (500 IU) strength tablets would be easier to use, since they do not have to be divided.

This method of keeping home canned fruit from darkening is not expensive, however. Mr. Powers and Dr. Fellers estimate it, on the basis of prices in drug stores in their town, at between one and two cents per pint jar when the 100 mg tablets are used.

The vitamin tablets are put into the jars before they are filled with the fruit. All the other details of the home canning procedure are followed as usual. If quart jars are used, of course twice the amount of vitamin should be put in each of these larger jars. The method is good for pears, peaches and plums. It does not keep home canned applesauce from darkening though it improves its appearance. Darkening of the applesauce depends more on the variety of apple.

Vitamin C prevents surface darkening and development of off flavor by preventing oxidation, the cause of the condition. Even commercial canners must face this problem. They can overcome it more easily than the housewife, however. For one thing, there is less headspace in the usual commercial jar, so there will be less oxygen to cause deterioration. The commercial canner, moreover, vacuum seals his jars, which means less air is entrapped, and he can, if necessary, deaerate the food.

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ENGINEERING

Liquid-Cooled Dynamos For Electric Generators

➤ THE LIQUID-cooling principle, long standard with internal combustion engines, is applied to electric generators, in patent 2,376,441, granted to Harold M. Martin of Schenectady, N. Y., assignor to the General Electric Company. Tooth-like recesses are cut into the rotor, and in these the coolant is carried around, held against escaping by the opposed smooth surface of the stator and by confining baffles at the sides.

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ELECTRONICS-PHOTOGRAPHY

New Flash-Bulb Timer

Permits photographs to be taken in three ten-thousandths of a second. The unit depends upon a constant rate of electrical voltage increase.

► SIX PICTURES in three ten-thousandths of a second is the top speed with which photographs can be taken with a new flash bulb timer. This means that you could take six pictures of a .50-caliber bullet while it moves half its own length, after being fired from a gun.

The timer, developed by the photographic engineers of the Air Technical Service Command at Wright Field, uses microflash bulbs supplied by Dr. Harold E. Edgerton, professor of electrical engineering at Massachusetts Institute of Technology. Each lamp flashes in two millionths of a second. Six microflash lamps may be set off, either in a series or simultaneously.

The unit depends upon a constant rate of electrical voltage increase for the rapid firing of the lamps. Six lamps are connected to voltage amplifiers, so set that each one is a little less sensitive to voltage increases than the one next to it. As current is passed through the amplifiers, and the voltage rises, the lamps are fired.

Technically, the timer uses linear charging of a condenser through a pentode tube, adapted from television. Linear charging makes it possible to time the pictures exactly by turning simple dials on the controls. The slowest speed at which the lamps can take a picture is six-tenths of a second.

The outfit is now used to study rupturing propeller blades, although it was originally conceived as a means of studying the effects of gunfire on armor plate. The first timer built could only take pictures within a range of six to eight feet. This distance has now been increased, and pictures can be made as far as 50 feet from the subject.

X-ray film and an f/2.5 night aerial camera lens are used to make the pictures. Microflash pictures are taken by opening the camera shutter in total darkness, flashing the lamps, then closing the shutter.

If necessary, the lamps may be set off by sounds which are picked up by microphones transmitting electrical impulses to the circuit. This is used in propeller-rupture studies where the exact instant of rupture cannot be predetermined.

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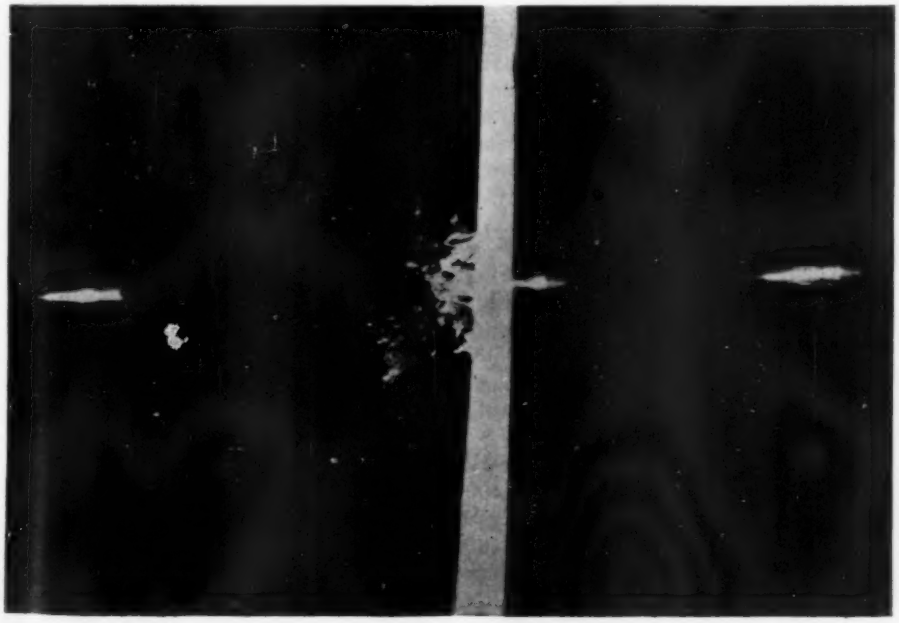

STANDS STILL!—Frozen by high speed photography at three points on its journey through an obstruction, this bullet apparently standing still, actually was speeding along its course when overtaken by microflashes at Air Technical Service Command headquarters at Wright Field.

PHYSICS

Physics Laboratory of Nobelist Found Intact

► DEPARTING Nazis have left undamaged the physical laboratory and equipment of Prof. Niels Bohr, world-famous scientist who in 1922 received the Nobel Prize for his researches on the structure of the atom. To the credit of leading German physicists, it is now made known that they refused to take possession of the Institute for Theoretical Physics when their political masters seized it on Dec. 6, 1943.

Because Prof. Bohr has Jewish blood in his veins, he expected persecution by the Nazis, and escaped to Sweden in October, 1943. With him went another eminent scientist who also had Jewish ancestors, Hungarian Prof. Georg Hevesey, who in 1943 was awarded the Nobel Prize in chemistry for his pioneer investigations on "heavy water."

Subsequently Prof. Bohr made his way to England, and on the pretext (subsequently proved groundless) that he was there engaging in war work for the Allies, the Nazis took possession of the Institute at Copenhagen, of which he is director. To insure against Danish sabotage of the equipment, Prof. Bohr's first assistant, a Dr. Boeggild, was imprisoned for seven weeks; and even the laboratory foreman was locked up for ten days. When the Nazis were unable to find any competent physicist in Germany willing to act as receiver of this stolen property they finally reluctantly returned the Institute to the University of Copenhagen.

During Prof. Bohr's exile he was able to keep in contact with his fellow-workers in the laboratory by correspondence. He is known to be in the United States at present, though his exact whereabouts remains undisclosed. It is expected that he and Prof. Hevesey will return to Copenhagen before very long.

Another leading Danish scientist still in Sweden is Prof. August Krogh, noted for his researches on vitamins, who is reported to be under threat of assassination by Nazi gangsters. Prof. Krogh was awarded the Nobel Prize in medicine and physiology in 1920, and in 1937 he was made Foreign Associate of the National Academy of Sciences, the highest honor to a foreigner within the gift of that leading American organization.

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ENGINEERING

Movies While You Ride On Tomorrow's Trains

► MOVIES while you travel will be commonplace on tomorrow's railroads, reported Charles W. Wright, vice-president and engineer of the Pullman Standard Car Manufacturing Company. Engineers and designers are giving more thought to passenger comfort during the waking hours on long trips, he stated.

"We have a new recreation car that is a conventional observation-lounge car by day, but at night it can be converted into a miniature theater and club, so that you can see movies or dance while you travel. It includes a refreshment bar, as well as tables and seats that fold back to provide dancing space. Observation chairs can be shifted to face the movie screen. In the dining cars, traditional rectangular tables have given way to diagonally placed tables with deep cushioned chairs and alcove divans," Mr. Wright stated, speaking as the guest on the CBS program "Adventures in Science" directed by Watson Davis.

The diagonally-placed tables in the diner will reduce aisle congestion and permit more efficient service, he pointed out.

For safety and comfort, Mr. Wright declared that tomorrow's trains will have intra-train telephone systems that will permit train crews to keep in constant touch with each other. Insulation, cushioning, and sound deadening will permit the control of temperatures within the cars, and eliminate noise and vibration. New electrically-controlled brakes will make smoother stopping possible in shorter distances. Soft springs and shock absorbers on the trucks of cars will give floating comfort ride.

Science News Letter, June 2, 1945

MEDICINE

Syphilis of Brain Helped By Penicillin Treatment

► DEMENTED patients and those suffering bouts of excruciating pain or unable to walk because of syphilis of the brain and nervous system may be helped by penicillin, it appears from a report by Dr. Douglas Goldman, of Cincinnati. (*Journal, American Medical Association*, May 26).

Penicillin alone and combined with fever treatment has been given to 22 such patients at Longwood State Hospital. In the group 18 had the mental disease, dementia paralytica, two had locomotor ataxia and two suffered the excruciating pain of tabes.

All but two of the 18 with mental symptoms have improved. Some are "apparently recovering rapidly from their disease," Dr. Goldman reports.

Of this group, two patients died. They were practically dying, in a "state of pronounced mental and physical deterioration" before the treatment was started. Penicillin was given them not with any hope of saving them but as a test of the safety of the drug for patients suffering from syphilis of the brain.

Of the patients with tabes, one was a woman who suffered every 30 days with five- to 12-day bouts of pain so severe she wanted to kill herself. She has been free from pain for about three months and has changed from a distracted, depressed state to one of normal warmth and brightness. The other patient in this class has also "enjoyed remarkable relief from pain."

It is too soon to be sure how the patients with locomotor ataxia will get along but one has shown some definite improvement.

The results are good enough, Dr. Goldman says, to justify further study of this method of treating neurosyphilis.

Science News Letter, June 2, 1945

HORTICULTURE

Fluorescent Lamps Take Place of Greenhouse

► CUTTINGS of woody plants have been successfully rooted in basement rooms, with fluorescent lamps substituted for the daylight of conventional greenhouse practice, in experiments reported by three U. S. Department of Agriculture workers, Dr. V. T. Stoutemyer, Albert W. Close and F. L. O'Rourke. These experiments, they suggest in *Science* (May 25), point the way to considerable possible savings in commercial nursery practice, since both temperature and humidity are more easily and cheaply controlled in rooms with ordinary walls than in glass houses.

The three men worked with a wide variety of plants, including citrus, cinchona, hibiscus, bougainvillea, weigela and privet. Soil temperature was maintained at the desired level by means of lead-coated heating cables. Some of the plants responded best to continuous illumination; others gave better results when they had light for only 16 hours out of the 24. The needs of each species must be worked out individually.

Science News Letter, June 2, 1945

IN SCIEN

AERONAUTICS

Four-Engine Flying Boat Is Largest British Plane

► THE LARGEST British airplane yet to take to the air is the 58-ton four-engined Shetland Flying Boat that could fly from London to Bombay, about 4,650 miles, non-stop at 184 miles an hour. It is larger and has a longer range than the American-built Martin "Mars," largest U. S. flying boat. The airplane is a double-deck ship with accommodations for 70 passengers and a crew of 11, and is fully air-conditioned. There are three main compartments as well as a promenade on the after upper deck, a fully equipped kitchen, and rest rooms.

The new giant of the sky, built by Short Brothers, is powered by four 2,500 horsepower Bristol Centaurus air-cooled, 18-cylinder engines. These powerful engines turn four-bladed propellers which have blades measuring 15 feet, 9 inches in length.

The wingspan of the Shetland is 150 feet, greater than that of a B-29 Superfortress, and it has an overall length of 110 feet. Fuel tanks carry more than 6,000 gallons of gasoline and 320 gallons of oil.

Science News Letter, June 2, 1945

CHEMISTRY

Anti-Knock Motor Fuel Uses Lead Substitutes

► ANTI-KNOCK motor fuels of high octane value can now be produced through the addition of compounds of heavy metals other than lead. U. S. patent 2,375,236 has been issued to Dr. Pharis Miller of Elizabeth, N. J., on a basal formula for the anti-knock compounds; he has assigned rights to the Standard Oil Development Company, by which he is employed.

One compound which Dr. Miller regards as especially successful is built around the relatively little known element rhodium; the molecule also contains the carbon monoxide and ammonium groups and either iodine or chlorine. For the rhodium, any of the following elements may be substituted: copper, thorium, lead, chromium, manganese, iron, nickel or cobalt.

Science News Letter, June 2, 1945

E FIELDS

BOTANY-CHEMISTRY

Pine Tree Produces Useful New Chemical

➤ THE PINE tree produces a chemical to keep its heart sound. This chemical, which has the somewhat poetic name of pinosylvine, may also prove useful to humans in their struggle against disease germs, it appears from studies reported by Dr. K. O. Frykholm, of the Institute of Public Health, Stockholm, in *Nature*, British scientific journal.

Pinosylvine was discovered in 1939 by another scientist. It protects the tree's dead heart-wood against wood-decaying fungus and insects. The dead heart-wood is both the principal mechanical support of the tree and makes the best lumber. Chemically, pinosylvine is a derivative of stilbene and closely related to resorcine and its derivative, hexyl-resorcine.

This led Dr. Frykholm to explore further its anti-germ properties. He found that its power to stop the growth and kill one of the germs that cause food poisoning is from seven to 30 times as strong as that of phenol, or carbolic acid.

Pinosylvine and its monomethyl ether, Dr. Frykholm concludes from this and other tests, seem to have the strongest germ-killing power of any phenol substance found in nature and isolated. This suggests possible use as an antiseptic.

Its poisonous action, however, is greater than that of phenol. The poisoning symptoms are different, there being no convulsions.

Science News Letter, June 2, 1945

MILITARY SCIENCE

Ship-Based Mortars Blast Jap Troops in Pacific

➤ TOUGH, maneuverable, and a small target; mortars mounted on infantry landing craft range up and down enemy-held coastlines in the Pacific theater lobbing shells into areas which cannot be reached by ordinary artillery. The path of the mortar shell is a sharp arc, like the trail of a robot bomb. As one infantryman remarked, "You can shoot over a wall and hit the vines creeping up the other side."

The new mortar-carrying ships, after dropping their cargoes of infantrymen on the beaches, throw up intense fire to fill the interval between the cessation of naval gunfire and the opening bursts of our land-based artillery. Observers on Iwo Jima reported that Yanks on the beachhead were supported in part by the hard-hitting mortar boats which rampaged along the coastlines blasting Japanese supply areas and troop concentrations and knocking out enemy artillery emplacements.

The idea for using ship-based mortars was developed by the Pacific Ocean Areas Chemical Warfare Service. A successful weapon in the European theater, the 4.2-inch chemical mortar is proving its worth again in these Pacific operations. It is actually a light, mobile cannon, designed for rapid high-angle fire of large capacity shells, its maximum range is generally less than 3,000 yards or about one and one-half miles.

Science News Letter, June 2, 1945

CHEMISTRY

Four Ways to Make Styrene From Petroleum Fractions

➤ STYRENE, which is combined with butadiene to make GR-S, most commonly used of synthetic rubbers, can be produced from petroleum fractions by a number of methods. Patents on four such methods have been issued to three chemists on the staff of Universal Oil Products Company, of Chicago, to which firm all rights have been assigned.

Dr. Gustav Egloff, well-known chemist who is director of research for Universal, received patent 2,376,532 and 2,376,-533. His process starts with a mixture of benzene and ethylene, which combine in the presence of a catalyst to form ethyl benzene. The latter compound is put through a second catalyzing process with ethane, in which a dehydrogenation reaction completes the conversion into styrene.

Somewhat similar is the process on which patent 2,376,709 was issued to Dr. William J. Mattox, except that a mixture of xylene and ethyl benzene is used instead of the ethane-ethyl benzene mixture. A high-octane motor fuel is one by-product of this process.

In the method on which patent 2,376,-549 was issued to Dr. Julian M. Mavity, both butadiene and styrene, the two ingredients of GR-S, are turned out simultaneously. In this process the essential materials are ethyl benzene and a petroleum fraction described only as "a normal C_4 hydrocarbon containing at least eight hydrogen atoms."

Science News Letter, June 2, 1945

PHYSIOLOGY

Movies Put Temperature Up, Do Not Relax Body

➤ HOLLYWOOD may be able to use a new scientific finding to predict the box-office success of various pictures. All that would be necessary would be to take the temperatures of members of preview audiences before and after seeing the film, Dr. N. Kleitman, of the University of Chicago, suggests. (*Science*, May 18)

Body temperature goes up from one-half to one degree Fahrenheit while attending motion pictures, Dr. Kleitman has found. The rise is enough to be called "highly significant."

Going to the movies is far from being relaxing in the physiological sense, this finding shows. The picture may give "escape from the humdrum reality of existence." However, even though the spectator is sitting, presumably relaxed in a comfortable seat, for two or more hours, the subject matter of the film makes his muscles tense to such an extent that his temperature goes up.

Dr. Kleitman became interested in the effect of motion pictures in the course of a long study of the daily body temperature cycle. He found that after attending a two- or three-hour motion picture show, the subject's temperature was higher than usual for that particular time of day.

A teen-aged girl who went to the movies every two or three weeks over a period of two years and a young lady in her early twenties who was a "movie addict" and went to 29 shows in two months were subjects of special study.

The teen-ager's "movie" temperature ranged between 99 and 100.15 degrees Fahrenheit. At the same time, about 4 p.m., on non-movie days, it ranged from 97.95 F. to 99.70 F. The young lady "movie addict" went to shows mostly in the evening. Her temperature rose about half a degree on movie nights, though when she saw a double feature, her temperature was lower after the second feature than after the first. Either the second feature was less effective than the first in raising the temperature or the normal fall in temperature late in the evening was too strong to be reversed.

"It remains to be seen," says Dr. Kleitman, "whether the collective change in the body temperature of a preview audience can be used to predict the box-office success of a film."

Science News Letter, June 2, 1945

PHYSIOLOGY—GENETICS

Blood That Kills

Rh anti-bodies rob some babies of life and make transfusions dangerous for some people. Science has taken steps to overcome these handicaps.

By MARJORIE VAN DE WATER

See Front Cover

➤ BLOOD that kills. . . . Babies robbed of the blood of life before they ever taste their first breath. . . . Mothers weakened and sometimes killed by the blood of their loved ones. . . . Children who must go through life with minds dulled or damaged. . . . Wounded soldiers that may be killed by transfusions intended to restore them to health.

This is the tragic story of Rh—blood group only recently known to science.

There is nothing poisonous about Rh blood. It is normal, healthy blood. Probably you, yourself, have Rh blood. Between eight and nine persons out of every 10 do have it. But a few persons—15 out of each hundred in the United States—do not have Rh blood.

And that is where the trouble comes, because Rh blood and blood which does not have this Rh factor do not mix well. It won't hurt you, if you have Rh blood, to have a transfusion of blood that does not have the Rh factor—Rh negative blood, it is called. A single transfusion of Rh blood won't hurt the person with Rh negative.

But after one transfusion, the Rh blood in an Rh negative person acts in somewhat the way a disease germ does to set up automatic defenses in the blood stream. So the Rh negative person starts to create a substance in the blood to kill and drive out the Rh blood.

Very Powerful

This killing substance is very powerful. If repeated transfusions of Rh blood should be given this person who has built up the anti-Rh substance, the Rh blood would literally be consumed, destroyed, the blood cells killed—completely. The dead cells then act as a poison in the kidneys of the patient. (*See story on page 338*)

It was not easy to see the link between this killer in the blood and the deaths of infants at birth or before birth or a few days after birth. Even after the Rh blood factor had been identified, physicians did not understand at first how it could kill infants.

It was first found in Rhesus monkeys and that is how it got its name, the Rhesus factor or Rh, for short.

For many years, a real-life medical mystery drama has been acted and re-enacted. For years, medical scientists have been searching for the solution—trying to track down and identify the killer.

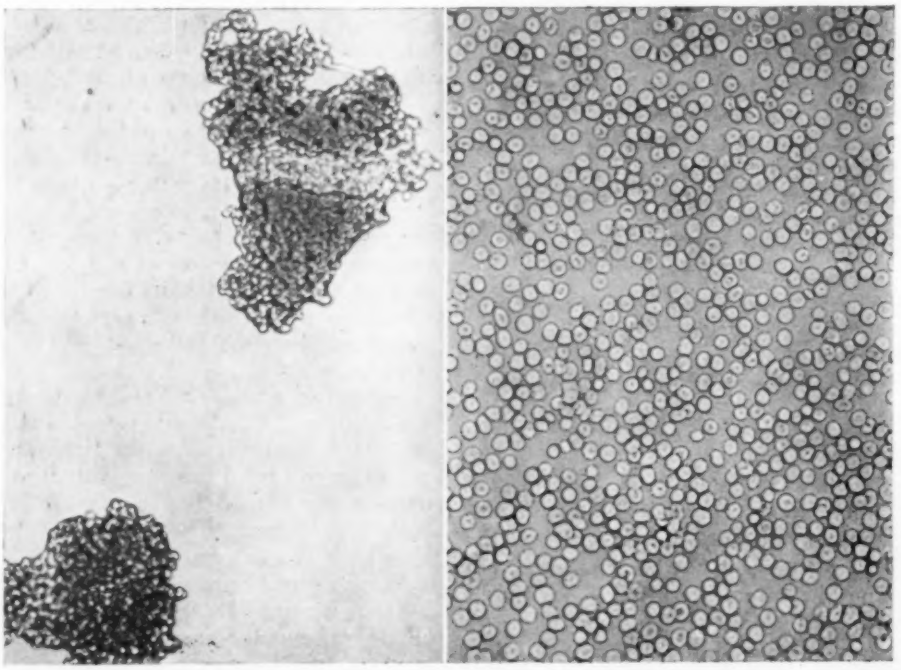
This was the plot: A father and mother have one child. Thus far, it looks as though the story might have a happy ending. But now tragedy enters; the second child dies at or before birth, or perhaps lives a matter of hours or days. There is nothing to account for the death, so the parents are still hopeful of adding to their little family. And then may follow a long series of domestic tragedies; child after child may die in the same way. Why?

Well, this was at last found to be the solution: The father, like 84 other men out of each hundred, has Rh blood. The mother has Rh negative blood. Because the Rh factor is what students of heredity know as a dominant trait, the child with one Rh positive parent and one Rh negative parent will always be Rh positive.

So it happens that the mother with Rh negative blood is carrying a child who inherits in its own blood the Rh positive factor. And there is a little, not much, but a little mingling of the blood of mother and unborn child.

This does not hurt the baby at first, because the Rh negative blood has nothing in it that can harm the blood of an Rh positive person. But when the Rh factor from the baby's blood enters the bloodstream of the mother, then harmful things do happen. The potent anti-bodies—the Rh killers—are built up in the mother's blood. And, gradually, these anti-bodies are transferred to the bloodstream of the infant.

The process goes on quite slowly. So that the first child may be safely born



FINAL EXAMINATION—After incubation and centrifuging, the blood is examined under a microscope. If the cells have clumped together (left), then the blood is positive Rh blood. If the cells show the normal distribution after the serum, then the blood is Rh negative (right). Photographs by the Army Institute of Pathology for Science Service.

TESTING FOR RH—The small vial (left) contains enough serum to make hundreds of tests to find out whether blood is Rh positive. After the blood to be tested has been diluted with salt solution, it is put in the tube with the anti-Rh serum (right). Photographs by Fremont Davis, Science Service Staff photographer.

before too much harm is done. Usually, the mother has great difficulty during the birth and may be so ill that she needs a blood transfusion. If, then, the husband comes forward as is natural and offers his blood for the transfusion, the result may be very bad for the mother. But, in general, both mother and the first child may survive.

But the anti-bodies do not disappear from the blood of the mother after this birth. They are there for three or four years or possibly even for the entire lifetime of the mother; the exact length of time they survive is not yet known. But during all the time that the anti-bodies are there in abundance in the mother's bloodstream she can never give birth to another Rh positive child. Not, that is, without the intervention of modern medical skill.

Now that the killer in this particular medical mystery is known, it is possible, in some cases, to save the baby before the Rh anti-bodies have done their deadly work.

The baby shown on the cover of this SCIENCE NEWS LETTER in a photograph by Fremont Davis, staff photographer, lives today because of recent knowledge about Rh.

When the baby is born with blood partly or almost entirely destroyed in the condition called erythroblastosis and the normal red blood replaced by a greenish-yellow substance that makes the infant take on a jaundiced look, they give it immediate transfusions. The transfusions must be with Rh negative blood, because Rh positive would immediately be destroyed by the anti-bodies that permeate the baby's blood.

Not one, but many transfusions are given, so that the baby's blood is entirely replaced by the fresh, donated blood. So much new blood is given that the baby's blood-group is completely changed.

In modern hospitals, the physicians are prepared for the arrival of an Rh baby to an Rh negative mother, because the mother's blood is typed, not only for the better known groups such as A, B, AB, or O, but also for Rh. Professional blood donors are typed for Rh and all those who have Rh negative blood kept ready for instantaneous call in case of need.

In New Jersey, the Paterson Board of Health and the Passaic County Medical Society have founded an Rh negative blood donors club from among Rh negative mothers. In that county, it is routine for the blood of many expectant mothers to be sent to the Board of Health for Wassermann tests. At the request of

Dagobert D. Runes, Editor

Do You Know?

The female *halibut* weighs 10 times as much as her mate.

Early-hatched *chicks* grow faster than those hatched late in the season.

A *half-inch rope* made of nylon can support a load of three tons.

Old *apple trees* in poor soil are invigorated by pruning, and by cutting out weak wood and slender outside shoots.

Oleomargarine, when properly fortified with vitamin A, is equal in nutritive value to butter.

America has shipped Russia 20,000 tons of *seeds* for 1945 spring planting, largely for garden and field crops.

Rats introduced on the Polynesian islands do much damage to growing coconuts.

A common *toad,* according to one estimate, is worth $25 a year to a farmer because of the large number of injurious insects it eats.

the Medical Society, the Board has also used part of the blood sample to type it for Rh. Naturally, these expectant mothers could not be expected to give their blood right away, but their names and addresses are kept so that in the future they may be called upon for the precious and at times badly needed donations.

Typing for Rh blood factor is done in much the same way as other blood group typing except that it must be done much more carefully. It is necessary to keep the blood sample at a certain temperature for quite a long time before the clumping of the blood cells shows up the fact that the sample is not of the same type as the test material.

Although it is always a hazard for a woman with Rh negative blood to have a child if her husband is Rh positive, it sometimes happens even without any special transfusions or other emergency care that the child in such a family may live and be healthy. That is because it is possible for the child to be itself Rh negative and so its blood would not be antagonistic to the blood of the mother.

50-50 Chance

Although, by the laws of genetics, an Rh positive father would always have an Rh positive child if he inherits Rh positive genes from both his parents, about half the Rh positive fathers do carry Rh negative inheritance. Then, in spite of having Rh positive blood himself, the father has a 50-50 chance that any of his children would receive the Rh negative part of his own inheritance. This may happen, even in families that have had previous tragic loss of their babies.

The Rh negative killer does not do all its damage in killing infants, however. Those who survive may still face the danger of lowered intelligence due, perhaps, to the destruction of blood cells at the critical time before birth. Evidence pointing to this further crime is found in tests of the blood of the mothers of feeble-minded children, the implications of which are discussed in a recent issue of the *Journal of Heredity*. A much higher proportion of Rh negative mothers was found than the 15% that might be expected from the proportion in the general population.

It has been suggested that all men in armed services should be typed for Rh in order to prevent danger to them through emergency transfusions. There are two good reasons why this was never done, however. In the first place, in most of the transfusions in our Army plasma and not whole blood is used, and in plasma the blood group of the donor does not matter. In the second place, there just is not enough of the rare Rh negative blood available to make the tremendously large quantity of serum that would be required to type the blood of eleven million men.

Both the Army and Navy are alert, however, to take advantage of all the recent discoveries in this field, and many lives have been saved in this way.

It is possible, whenever a man has had a bad reaction to a blood transfusion, to type that man's blood for Rh. If he is Rh negative, then any further transfusions given him must be Rh negative blood.

Much research is still ahead for medical scientists in this field before the crimes of Rh blood can finally be prevented. Since 1941, when this blood factor was originally discovered by the scientists Landsteiner and Wiener, much ground has already been explored, but unfortunately many of the attempts to solve the problem have failed to meet success. The idea was developed that the mother's blood might be tested frequently as the anti- (*Turn to page 350*)

BOTANY

NATURE RAMBLINGS

by Frank Thone

Sneeze-Stimulators

▶ HAYFEVER victims begin sneezing and sniffling early in spring, and keep it up until a plant-killing frost cuts off the supply of misery-bringing pollen. There are, however, two crescendos in the annual chorus of involuntary explosions. The first (and lesser) coincides with the blossoming of grasses and the narrow-leaved plantain; the second (and worst) comes with the mass shedding of pollen by the ragweeds. Many innocent flowers are falsely accused, and some troublemakers escape unsuspected.

A new summing-up of all available evidence has just been published in book form by a botanist who has made hayfever pollens and the plants that produce them the subject of his life research, Dr. Roger P. Wodehouse (*Hayfever Plants:* Chronica Botanica Company). In it he lists not only the plants known to be the chief sinners against the peace of the human nose, but the lesser offenders also; and he performs a service for innocent suspects by showing up the paucity of the evidence.

Only half-a-dozen herbaceous families harbor hayfever weeds: grasses, composites (notably the ragweeds, of course), chenopods, pigweeds, plantains and docks. And there are only eight families of woody plants whose pollen makes nasal linings swell and eyes turn red; they range from birches and beeches through maples and ashes.

Even within any given family there are usually only a few irritating members. Thus, among the cockleburs, closely related to the ragweeds, only one or two species produce enough pollen to be worth bothering about. Again, while the English or narrow-leaved plantain is perhaps the worst of the provokers of early hayfever, its two nearest relatives in this country figure hardly at all in it.

Mere abundance of wind-carried pollen does not suffice to convict a plant as an offender. Dr. Wodehouse points out that the whole great group of conifers—the pines, spruces, firs, etc.—cast enormous quantities of pollen to the winds every spring, yet only the sub-group comprising the junipers, cypresses and their immediate kin, are known to be really troublesome hayfever causes. Again, while several grass species make many sneezes, the abundant pollens of sedges and cattails seems to be quite innocent. A pollen must be not only abundant and wind-borne, but specifically capable of causing the peculiar kind of poisoning known as allergy, to rate a place in the hayfever rogues' gallery.

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AERONAUTICS

New French Planes

➤ FRANCE'S aviation industry is beginning to blossom forth, now that the Nazi war machine has been driven out by the Allies. Component parts of two airplanes were collected from their scattered hide-outs in barns and farm buildings near the Riviera.

Larger of the two airplanes is the Latecoere 631, a six-motor flying boat, with a twin tail that resembles the butterfly tail recently introduced into this country by Beechcraft. Re-erection of the plane was begun last September, and on March 6 of this year the 631 took off on its first test flight. While details of its performance are not available at present, results of the test were reported to be excellent by the French Air Ministry, in a story appearing in *The Aeroplane*, (March 23), British aviation periodical.

The other airplane, the Bellatrix, a passenger and military transport, was completed and ready for a test flight in the spring of 1943. The German authorities refused permission to flight-test the plane, and eventually it was dismantled and hidden to keep it out of Nazi hands. The present model weighs about 24,000 pounds. Two Gnome and Rhone 1,260 horsepower supercharged engines thrust it through the air at a cruising speed of 240 miles an hour over a range of 1,240 miles. It will carry 22 soldiers and their equipment.

The production model of the Bellatrix will have a tricycle landing gear and 1,600-horsepower motors, and will weigh about 6,000 pounds more than the prototype. As a medium-range civil airliner, it can carry 23 passengers and a crew of four. It has a wingspan of more than 75 feet and the length is over 55 feet.

Due to the problem of transporting supplies and equipment over France's much-bombed rail lines, production of the new planes will be delayed. However, production of at least one prewar French aircraft is already under way. The Bloch 161 looks like the Douglas DC-3, now standard equipment on all American airlines, but has a twin tail and four engines. It is now being produced, and is in service on French civil airlines. The four 1,050 engines give the plane a maximum speed of 267 miles an hour. The plane has a wingspan of 96 feet, 5 inches. It carries 33 passengers by day and sleeps 20 at night.

During the German occupation, French aeronautical engineers actively collected technical information from other countries, and quietly continued research work. The knowledge which they have acquired during the past five years will prove helpful to France in establishing herself after the war as a major factor in the aviation world.

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From Page 348

bodies slowly develop and before there were enough to destroy the blood of the baby, the infant might be taken by Cesarian operation and the child's life saved. So far, this has not proved successful.

It was even suggested that the mother might be de-sensitized to Rh blood in a way somewhat similar to the way a hay-fever sufferer is desensitized to ragweed pollen. This idea is still being tested.

But knowledge of the dangers of Rh blood is itself a partial defense. If an expectant mother knows that she has Rh negative blood and that her husband has Rh positive blood, her physician is in a position now to bring all the recent discoveries of modern medicine to her aid at the time of her baby's birth.

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• Books Just Off the Press •

AIR COMPRESSORS, THEIR INSTALLATION, OPERATION AND MAINTENANCE—Eugene W. F. Feller—*McGraw*, 460 p., illus., $4.50.

AIR NEWS YEARBOOK, Vol. 2—Phillip Andrews, ed.—*Duell*, 296 p., illus., $4.75.

THE ANALYSIS OF FOODS—Andrew L. Winton and Kate Barber Winton—*Wiley*, 999 p., illus., $12.

THE ARTIFICIAL INSEMINATION OF FARM ANIMALS—Enos J. Perry, ed.—*Rutgers Univ. Press*, 265 p., illus., $3.50.

THE ELECTRICAL INDUSTRY—Josephine Perry—*Longmans*, 128 p., illus., $1.75.

ELEMENTARY STATISTICS—Hyman Levy and E. E. Preidel—*Ronald*, 184 p., illus., $2.25.

EMOTIONAL PROBLEMS OF LIVING, Avoiding the Neurotic Pattern—O. Spurgeon English and Gerald H. J. Pearson—*Norton*, 438, $5.

ENGINEERING PREVIEW, an Introduction to Engineering Including the Necessary Review of Science and Mathematics—L. E. Grinter and others—*Macmillan*, 619 p., illus., $4.50.

EXPLORING JOURNALISM, with Special Emphasis on its Social and Vocational Aspects—R. E. Wolseley and Laurence R. Campbell—*Prentice-Hall, Inc.*, 482 p., illus., $5. A good treatment of writing and publishing newspapers and magazines, with attention to the important but specialized field of writing science for newspapers in a serious and accurate fashion.

FRANCOIS MAGENDIE, Pioneer in Experimental Physiology and Scientific Medicine in XIX Century France—J. M. D. Olmsted—*Schuman's*, 290 p., illus., $5 .

THE GLASS INDUSTRY—Josephine Perry—*Longmans*, 128 p., illus., $1.75.

HEALTH CARE FOR AMERICANS—C. E. A. Winslow—*Public Affairs Comm.*, 31 p., paper, illus., 10c.

HUNTING, FISHING, AND CAMPING—L. A. Anderson—*Macmillan*, 214 p., illus., $1.95.

PENICILLIN AND OTHER ANTIBIOTIC AGENTS—Wallace E. Herrell—*Saunders*, 348 p., illus., $5.

PLASTICS IN PRACTICE, a Handbook of Product Applications—John Sasso and Michael A. Brown—*McGraw*, 185 p., illus., $4.

POLYMER BULLETIN, vol. 1, no. 1—*Interscience*, 23 p., $2.40 a year. The first issue of a new magazine. Published bimonthly.

PROCEEDINGS, AMERICAN PHILOSOPHICAL SOCIETY, vol. 89, no. 1, Reports on Scientific Results of the United States Antarctic Service Expedition, 1939-1941—*Am. Philosophical Soc.*, 398 p., paper, illus., $4.

PUBLIC MEDICAL CARE, Principles and Problems—Franz Goldmann—*Columbia Univ. Press*, 226 p., $2.75.

SIMPLIFIED CARPENTRY ESTIMATING—J. Douglas Wilson and Clell M. Rogers—*Simmons-Boardman*, 288 p., illus., $3, 2nd ed.

WEEDS OF LAWN AND GARDEN, a Handbook for Eastern Temperate North America—John M. Fogg—*Univ. of Penn. Press*, 215 p., illus., $2.50.

Science News Letter, June 2, 1945

The Leningrad Institute of Applied Chemistry has developed a method of obtaining *Freon*, which previously had to be imported.

•New Machines and Gadgets•

❁ *MONEY-CHANGER, a self-service machine to get nickels for quarters and dimes to use in telephones and other slot machines, will be manufactured after the war. By a simple adjustment, street car and other tokens can be dispensed by it.*

Science News Letter, June 2, 1945

❁ *BREAST-PLATE black-out lantern, when worn on the front of the body, casts a light downward toward the feet. It is a flashlight device with reflectors to direct the light to assist in reading messages or in walking, with no rays escaping upward or to the front.*

Science News Letter, June 2, 1945

❁ *OFFICE CABINET and drinking cup dispenser has several compartments for towels and lavatory equipment, and a separate compartment on one side to hold paper drinking cups. They are released one at a time by an adjustable device on the bottom; by turning a screw, cups of different sizes may be used.*

Science News Letter, June 2, 1945

❁ *ROOFING shingles are now made of rectangular pieces with their lower half of uniform thickness and their upper half wedge-shaped. The base of the wedge is in the center of the shingle and about triple the thickness of the lower half. The interlocking of the shingles gives a better roof.*

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❁ *PATCHING DEVICE, shown in the*

picture, is used to seal bullet and shell holes up to four inches in size in gasoline and water tanks. It consists of a rubber ring of spongy synthetic rubber and a spring clamp. Two metal fingers grip the inside of the tank and hold the patch tightly in position.

Science News Letter, June 2, 1945

❁ *FULLY LIGHTED cigarettes are delivered one at a time from a new combination container and lighter. By a slight mechanical movement a cigarette is released to roll into a tray where one end comes in contact with an electrically heated coil.*

Science News Letter, June 2, 1945

❁ *OLD RAZOR BLADES clip the lawn in a home-made machine constructed by an ingenious American. An old vacuum cleaner motor, mounted in a box-like structure, powers a rotor with arms to which the blades are attached. An electric cord delivers the current to the motor.*

Science News Letter, June 2, 1945

❁ *POWER-OPERATED toothbrush is attached to the end of a special handle in which, by means of gears, a rotary motion is changed to a back-and-forward motion. The rotary motion is delivered to the mechanism inside the handle by a flexible shaft from a small motor.*

Science News Letter, June 2, 1945

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 261.*

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